Amendments to the Claims:

Please amend claims 1 and 24; cancel claims 2 and 29; and add new claims 30-33, as recited in the below listing of the claims. This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A computer-implemented method for generating a computer model of one or more teeth, comprising:

receiving as input a digital data set of meshes representing the teeth;

creating inside and outside meshes by determining an intersection between a tooth mesh and a cutter mesh;

creating a parametric representation of the teeth from the meshes representing the teeth and the inside and outside meshes, the parametric representation comprising exposed tooth surface image data and unexposed tooth portion image data, and further providing compression of the digital data set;

~~compressing the digital data set; and~~

displaying the parametric representation of the teeth providing the compressed digital data set so as to provide a high-resolution image of the teeth.

2. (Canceled)

3. (Previously presented) The method of claim 1, further comprising storing the compressed data in a file.

4. (Previously presented) The method of claim 1, further comprising transmitting the compressed data to a remote computer.

5. (Previously presented) The method of claim 4, further comprising displaying the compressed data on the remote computer.

6. (Previously presented) The method of claim 4, wherein the compressed data are transmitted over a network.

7. (Previously presented) The method of claim 6, wherein the network is a wide area network.

8. (Previously presented) The method of claim 6, wherein the network is the Internet.

9. (Previously presented) The method of claim 2, wherein creating a parametric representation further comprises generating a curve network.

10. (Previously presented) The method of claim 9, further comprising fitting the curve network to the digital data set.

11. (Previously presented) The method of claim 1, wherein receiving the digital data set comprises receiving data obtained by scanning a physical model of the teeth.

12. (Previously presented) The method of claim 1, further comprising scanning a physical model of the teeth with a destructive scanning system.

13. (Previously presented) The method of claim 12, further comprising scanning the physical model with a laser scanning system before scanning the model with the destructive scanning system.

14. (Previously presented) The method of claim 13, further comprising scanning physical models of a patient's upper and lower teeth in occlusion with the laser scanning system before scanning with the destructive scanning system.

15. (Previously presented) The method of claim 1, wherein the digital data set includes volume image data of the teeth and the method includes converting the volume image data into a 3D geometric model of the tooth surfaces.

16. (Canceled)

17. (Previously presented) The method of claim 1, further comprising joining the inside and outside meshes to create a closed surface for each of the individual teeth.

18. (Previously presented) The method of claim 1, further comprising rendering a three-dimensional (3D) graphical representation of the individual teeth.

19. (Previously presented) The method of claim 18, further comprising receiving an instruction from a human user to modify the graphical representation of the teeth and modifying the graphical representation in response to the instruction.

20. (Previously presented) The method of claim 18, further comprising modifying the selected data set in response to the instruction from the user.

21. (Previously presented) The method of claim 1, further comprising delivering data representing positions of the teeth at selected points along treatment paths to an appliance fabrication system for use in fabricating at least one orthodontic appliance structured to move the teeth toward a final position for the teeth.

22. (Previously presented) The method of claim 1, further comprising storing the compressed data set as a 3D geometric model representing visible surfaces of the corresponding tooth.

23. (Previously presented) The method of claim 22, further comprising modifying each 3D model to include hidden surfaces of the corresponding tooth.

24. (Currently Amended) A computer-implemented method for generating a computer model of one or more teeth, comprising:

receiving as input a digital data set of meshes representing the teeth;

receiving an input signal from a 3D gyroscopic input device controlled by a human user and using the input signal to alter an orientation of the teeth in the graphical representation;

creating a parametric representation of the teeth from the meshes, the parametric representation comprising exposed tooth surface image data and unexposed tooth portion image data, and further providing compression of the digital data set;

~~compressing the digital data set;~~

displaying the computer model of the teeth using a parametric representation;

rendering a three-dimensional (3D) graphical representation of the individual teeth; and

allowing a human user to select a tooth in the graphical representation and, in response, displaying information about the tooth, the information comprising an interproximal area or a tooth root shape information.

25. (Previously presented) The method of claim 24 wherein rendering the graphical representation comprises rendering the teeth at a selected one of multiple viewing orthodontic-specific viewing angles.

26. (Previously presented) The method of claim 24, further comprising providing a user interface through which a human user can provide text-based comments after viewing the graphical representation of the teeth.

27. (Previously presented) The method of claim 24, wherein rendering the graphical representation comprises downloading data to a remote computer at which a human user wishes to view the graphical representation.

28. (Canceled)

29. (Canceled)

30. (New) A computer-implemented method for generating model of a patient's teeth from a first 3D model of the patient's teeth for efficient transmission of patient information, the method comprising:

receiving as input the first 3D model comprising a digital data set of meshes representing the patient's teeth;

creating from the digital data set of meshes a parametric representation of the digital data set comprising a curve network fitted to the digital data set, the parametric representation comprising exposed tooth surface image data and unexposed tooth portion image data, and further providing a compressed version of the digital data set; and

storing the parametric representation in a file for transmission of the parametric representation to a remote computer and displaying of a high-resolution image of the patient's teeth, the high-resolution image comprising tooth interproximal area information or a tooth root shape information.

31. (New) The method of claim 30, wherein the fitting comprises obtaining a location of a sample point, obtaining a normal or a tangent for the sample point, generating a (u, v) representation for the sample point, and building the curve network from the (u, v) representation.

32. (New) The method of claim 30, wherein the fitting comprises selecting a set of sample points from the digital data set, generating tangent values for the sample points to define a curve, and determining the length of the curve.

33. (New) The method of claim 1, wherein the unexposed portion of the tooth comprises an interproximal surface area of a tooth or a tooth root.